

DEC 27 2006

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND  
INTERFERENCES**

In re PATENT APPLICATION of:

FINK et al.

Group Art Unit: 3532

Appln. No.: 10/705,224

Examiner: MacArthur, Sylvia

Filed: November 12, 2003

Title: METHOD AND APPARATUS FOR IMPROVED BAFFLE PLATE

**APPEAL BRIEF**

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37 C.F.R. § 41.37(c)(i) - Real Party in Interest

The real party in interest for this Appeal and the present application is Tokyo Electron Limited by way of an Assignment recorded in the U.S. Patent Trademark Office at Reel/Frame 015102/0834.

37 C.F.R. § 41.37(c)(ii) - Related Appeals and Interferences

There are presently no appeals or interferences known to the Appellants, the Appellants' representatives or the Assignee, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

37 C.F.R. § 41.37(c)(iii) - Status of Claims

Claims 1-17 are pending. Claims 1-17 stand rejected and are on appeal. The claims on appeal are set forth in the attached Appendix. Claims 1, 16 and 17 are independent. Claims 2-15 depend, either directly or indirectly, from claim 1. There are no claims dependent from either claim 16 or claim 17.

37 C.F.R. § 41.37(c)(iv) - Status of Amendments

An Amendment was filed on June 7, 2006, in response to the Final Office Action dated March 7, 2006. The amendments presented by the June 7<sup>th</sup> response were not entered for purposes of this appeal, as evidenced by the Advisory Action dated June 16, 2006. Accordingly, those amendments are not included in the claims appended hereto.

37 C.F.R. § 41.37(c)(v) - Summary of Claimed Subject Matter

Independent claims 1, 16, and 17 are described below, with reference being made to the drawings and reference numerals in the specification. This description is intended to facilitate

an understanding of the claims by members of the Board and is not intended as a comprehensive claim construction, such as used in the context of an argument of invalidity or infringement. Any reference to more than one reference number or character for any particular claimed element or limitation is illustrative only and is not to be construed as an admission that the claims are limited to any, or all, of the particularly disclosed embodiments.

Independent claim 1 recites a baffle plate assembly for surrounding a substrate holder in a plasma processing system comprising:

a centering ring (item 100 in Figs. 6-9, 11, 13B, and 13D; page 8, line 10 – page 9, line 22; and item 400 in Fig. 13F, page 10, line 28 – page 11, line 2) configured to be coupled to said substrate holder (item 30 in Fig. 1; page 4, lines 16-25), wherein at least a portion of said centering ring extends radially outside a periphery of said substrate holder; and

a baffle plate (item 64 in Figs. 1-5, 11-13D and item 164 in Figs. 13E-13F; page 5, lines 16-24; item 164 in Figs. 13E-13F; page 10, line 28 – page 11, line 2) comprising one or more passageways (item 90 in Figs. 2A-5; page 7, lines 3-15), wherein said baffle plate is configured to be centered within said plasma processing system (item 1 in Fig. 1; page 4, lines 16-25) by coupling said baffle plate to said portion of said centering ring extending radially outside said periphery of said substrate holder.

Independent claim 16 recites a disposable baffle plate for surrounding a substrate holder in a plasma processing system comprising:

a ring (item 64 in Figs. 1-5, 11-13D and item 164 in Figs. 13E-13F; page 5, lines 16-24; item 164 in Figs. 13E-13F; page 10, line 28 – page 11, line 2) comprising a first edge (item 86 in Figs. 2A-5; page 6, line 30 – page 7, line 2]) configured to be coupled to said substrate holder (item 30 in Fig. 1; page 4, lines 16-25) via a centering ring (item 100 in Figs. 6-9, 11, 13B, and 13D; page 8, line 10 – page 9, line 22; item 400 in Fig. 13F, page 10, line 28 – page 11, line 2) with at least a portion of said centering ring extending radially outside a

periphery of said substrate holder, a second edge (item 88 in Figs. 2A-5; page 6, line 30 – page 7, line 2) configured to be proximate a wall of said plasma processing system (item 1 in Fig. 1; page 4, line 16-25), and one or more openings (item 90 in Figs. 2A-5; page 7, lines 3-15) to permit the passage of gas therethrough,

wherein said coupling of said first edge to said centering ring facilitates centering said ring in said plasma processing system such that a space between said second edge and said wall is substantially constant.

Independent claim 17 sets forth a method of replacing a baffle plate (item 64 in Figs. 1-5, 11-13D and item 164 in Figs. 13E-13F; page 5, lines 16-24; item 164 in Figs. 13E-13F; page 10, line 28 – page 11, line 2) disposed adjacent a centering ring (item 100 in Figs. 6-9, 11, 13B, and 13D; page 8, line 10 – page 9, line 22; and item 400 in Fig. 13F, page 10, line 28 – page 11, line 2) with at least a portion of said centering ring extending radially outside a periphery of a substrate holder (item 30 in Fig. 1; page 4, lines 16-25), said baffle plate surrounding said substrate holder in a plasma processing system, the method comprising:

removing said first baffle plate from said centering ring in said plasma processing system; and

installing a second baffle plate in said plasma processing system by coupling said second baffle plate to said centering ring, wherein said coupling facilitates auto-centering of said second baffle plate in said plasma processing system.

37 C.F.R. § 41.37(c)(vi) – Grounds of Rejection to be Reviewed on Appeal

The March 7, 2005 Office Action rejects claims 1, 3-5, 9-14, and 16 under 35 U.S.C. § 102(b) as being anticipated by Hiroyuki (Japanese Patent No. 2002-252209). Claims 1, 6-8, and 14-16 were rejected under 35 U.S.C. § 102(b) as being anticipated by Tomoyasu et al. (U.S. Patent No. 6,264,788). In addition, claims 1, 8, and 14-16 were rejected under 35

U.S.C. § 102(e) as being anticipated by Li et al. (U.S. Patent No. 6,506,685). Claims 1, 7-13, 16, and 17 also were rejected under 35 U.S.C. § 102(e) as being anticipated by Ludviksson et al. (U.S. Patent Application Publication No. 2005/0041238). Next, claim 2 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hirovuki or Tomoyasu et al. in view of Kanno et al. (U.S. Patent No. 6,646,233).

37 C.F.R. § 41.37(c)(vii) – Argument

Claims 1, 3-5, 9-14, and 16 Are Not Anticipated by Hirovuki

In rejecting claims as anticipated under 35 U.S.C. § 102 a reference must teach each and every element of the claim. According to MPEP § 2131:

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Hirovuki cannot anticipate claims 1, 3-5, 9-14, and 16 because it fails to disclose, among other features, a centering ring or any structure that might be considered to be a centering ring. Hirovuki describes a plasma etching apparatus that includes an insulating ring 13 and first and second bellows covers 14, 15 formed from yttrium fluoride (YF<sub>3</sub>). (Hirovuki at the abstract.) A baffle plate 12 is positioned beneath the insulating ring 13 between an end face of the electrode protection member 8 and a side face of the electrostatic chuck 4. (Hirovuki at paragraph [0018].) The first bellows covering 14 is installed from the bottom surface of the baffle plate 12. (Hirovuki at paragraph [0018].)

Contrary to the Examiner's assertion, there is nothing in Hirovuki that describes the insulating ring 13, the electrode protection member 8, or any other structure as a centering ring. There is also no discussion of a centering ring that is coupled to the substrate holder

where at least a portion of the centering ring extends radially outside a periphery of said substrate holder. It follows, then, that Hirovuki does not describe any arrangement where the baffle plate 12 is centered within the plasma processing system by coupling the baffle plate 12 to a portion of a centering ring extending radially outside the periphery of the substrate holder. Accordingly, the Appellant respectfully submits that Hirovuki does not describe each and every feature recited by claims 1-15. For these reasons, among others, the Appellant respectfully submits that Hirovuki cannot be relied upon to anticipate any of claims 1-15.

Claim 16 also is not anticipated by Hirovuki for similar reasons. Hirovuki fails to describe a ring coupled to the substrate holder via a centering ring, where at least a portion of the centering ring extends radially outside a periphery of the substrate holder. Accordingly, Hirovuki cannot be relied upon to anticipate claim 16.

Claims 1, 6-8, and 14-16 Are Not Anticipated by Tomoyasu et al.

Tomoyasu et al. also fails to anticipate any of the claims. Tomoyasu et al. describes a plasma treatment method and apparatus with a ring 325 freely detachably attached to the outer circumference of a susceptor 305. (Tomoyasu et al. at col. 11, lines 5-7.) A baffle plate 326, with a plurality of holes 328 therein, is made integral to the ring 325. (Tomoyasu et al. at col. 11, lines 12-13, emphasis added.) As discussed in Tomoyasu et al., the ring 325 may be detached from the susceptor 305 for cleaning. (Tomoyasu et al. at col. 11, lines 47-50.) In fact, prior to etching, plural rings 325 are prepared relative to the susceptor 305 so that one can be attached to the susceptor 305 while another is being cleaned. (Tomoyasu et al. at col. 12, lines 12-15.)

Since the baffle plate 326 is integrally formed with the ring 325, Tomoyasu et al. does not describe or suggest any centering ring coupled to the substrate holder where at least a portion of the centering ring extends radially outside a periphery of said substrate holder.

There is no discussion of a removable baffle plate that is centered by coupling the baffle plate to the portion of the centering ring extending radially outside said periphery of the substrate holder. Accordingly, Tomoyasu et al. can not be said to describe each and every feature recited by claims 1-15. As a result, claims 1-15 cannot be anticipated by Tomoyasu et al.

Claim 16 may be distinguished from Tomoyasu et al. for similar reasons. As with claims 1-15, there is nothing in Tomoyasu et al. that may be said to describe or suggest a ring coupled to the substrate holder via a centering ring, where at least a portion of the centering ring extends radially outside a periphery of the substrate holder. Accordingly, the Appellant respectfully submits that Tomoyasu et al. also cannot be relied upon to anticipate claim 16.

Claims 1, 8, and 14-16 Are Not Anticipated by Li et al.

The Appellant also respectfully submits that Li et al. cannot anticipate any of the claims. Li et al. describes a perforated plasma confinement ring 222 for a plasma reactor where a perforated plasma confinement ring 222 is disposed outside of the outer periphery of the bottom electrode 210 such that the perforated plasma confinement ring 222 abuts the focus ring 216, if the focus ring 216 is present. (Li et al. at col. 5, lines 25-28.) The focus ring 216, which is optional, is disposed around the outer periphery of the bottom electrode 210. (Li et al. at col. 5, lines 5-7.) There is no discussion that the focus ring 216 is a centering ring. To the contrary, the focus ring 216 appears to form the housing for the bottom electrode 210.

Noticeably absent from Li et al. is any discussion of a centering ring coupled to the substrate holder where at least a portion of the centering ring extends radially outside a periphery of said substrate holder. In addition, there is no discussion of a baffle plate that is centered within the plasma processing system by coupling the baffle plate to the portion of the centering ring extending radially outside said periphery of the substrate holder.

Accordingly, the Appellant respectfully submits that Li et al. does not describe each and every feature recited by claims 1-15. As a result, claims 1-15 cannot be anticipated by Li et al.

Claim 16 may be distinguished from Li et al. for similar reasons. As with claims 1-15, there is nothing in Li et al. that may be said to describe or suggest a ring coupled to the substrate holder via a centering ring, where at least a portion of the centering ring extends radially outside a periphery of the substrate holder. Accordingly, the Appellant respectfully submits that Li et al. also cannot be relied upon to anticipate claim 16.

Claims 1, 7-13, 16, and 17 are not anticipated by Ludviksson et al.

Next, the Appellant respectfully submits that Ludviksson et al. cannot anticipate any of claims 1-17. Ludviksson et al. describes a method of using a sensor gas to determine the erosion level of consumable system components in an apparatus having a baffle plate 64 that extends about the periphery of the substrate holder 30. (Ludviksson et al. at paragraph [0047].) As Fig. 1 makes apparent, the baffle plate extends outwardly from the shield 14. There is no discussion in Ludviksson et al. of any an arrangement with a centering ring coupled to the substrate holder where at least a portion of the centering ring extends radially outside a periphery of said substrate holder. In addition, there is no discussion of a baffle plate being centered within the plasma processing system by coupling the baffle plate to the portion of the centering ring extending radially outside said periphery of the substrate holder. Accordingly, Ludviksson et al. cannot anticipate any of claims 1-15.

Claim 16 may be distinguished from Ludviksson et al. for similar reasons. As with claims 1-15, there is nothing in Ludviksson et al. that may be said to describe or suggest a ring coupled to the substrate holder via a centering ring, where at least a portion of the centering ring extends radially outside a periphery of the substrate holder. Accordingly, the



Appellant respectfully submits that Ludvikkson et al. also cannot be relied upon to anticipate claim 16.

Claim 17 also may be differentiated from Ludvikkson et al. for similar reasons. As with claims 1-16, there is nothing in Ludvikkson et al. that may be said to describe or suggest replacing a baffle plate disposed adjacent to a centering ring with at least a portion of the centering ring extending radially outside a periphery of the substrate holder. Accordingly, the Appellant respectfully submits that Ludvikkson et al. also cannot be relied upon to anticipate claim 17.

Claim 2 is not obvious over Hiroyuki or Tomoyasu et al. in view of Kanno et al.

In rejecting claims under 35 U.S.C. § 103(a), several basis factual inquiries must be made to determine obviousness or non-obviousness of patent application claims under 35 U.S.C. § 103. These factual inquiries are set forth in Graham v. John Deere Co., 383 US 1, 17, 148 USPQ 459, 467 (1966);

Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or non-obviousness of the subject matter is determined.

As stated by the Federal Court in In re Ochiai, 37 USPQ 2d 1127, 1131 (Fed. Cir. 1995);

[T]he test of obviousness *vel non* is statutory. It requires that one compare the claim's subject matter as a whole with the prior art to which the subject matter pertains. 35 U.S.C. § 103. The inquiry is thus highly fact-specific by design . . . When the references cited by the Examiner fail to establish a *prima facie* case of obviousness, the rejection is improper and will be overturned. In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988) (Emphasis added.)

In rejecting claims under 35 U.S.C. § 103(a), an Examiner bears an initial burden of presenting a *prima facie* case of obviousness. A *prima facie* case of obviousness is established only if there is a suggestion or motivation to combine reference teachings; a reasonable expectation of success; and the prior art references, when combined, teach or suggest all the claim limitations. If an Examiner fails to establish a *prima facie* case, a rejection is improper and will be overturned. See In re Rijckaert, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993). "If examination . . . does not produce a *prima facie* case of unpatentability, then without more, the Appellant is entitled to the grant of the patent." In re Oetiker, 977 F.2d 1443, 1445-1446, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

The requisite standard for motivation to combine references requires a showing that one of ordinary skill in the art would have been motivated to combine the references not that they may have combined the references. Under MPEP § 2143, to establish a *prima facie* case of obviousness, three basic criteria must be met. Primarily, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

With respect to the rejection of claim 2 as obvious, the Appellant does not repeat the discussion of the faults found with respect to either Hiroyuki or Tomoyasu et al. The Appellant respectfully points out that Kanno et al. describes a wafer stage for a wafer processing apparatus and a wafer processing method that excludes any centering ring or

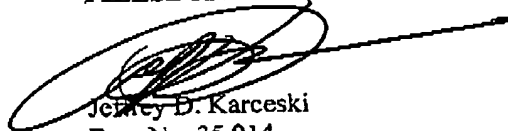
baffle plate. Accordingly, the Appellant submits that those skilled in the art would not think to combine Kanno et al. with the remaining references to render obvious any of claims 1-17. Accordingly, even assuming it would have been obvious to combine these three references, which Appellants do not concede, the combination would not disclose or suggest all the limitations of claim 2 and would not present a *prima facie* case of obviousness.

#### Conclusion

For at least the reasons discussed above, the Appellants respectfully request this Honorable Board to reverse the rejection of these claims and direct that the claims be passed to issue.

Respectfully submitted,

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Attachment:

Claims appendix  
Evidence appendix  
Related proceedings appendix

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37 C.F.R. § 41.37(c)(viii) - Claims appendix

1. A baffle plate assembly for surrounding a substrate holder in a plasma processing system comprising:  
  
a centering ring configured to be coupled to said substrate holder, wherein at least a portion of said centering ring extends radially outside a periphery of said substrate holder;  
  
and  
  
a baffle plate comprising one or more passageways, wherein said baffle plate is configured to be centered within said plasma processing system by coupling said baffle plate to said portion of said centering ring extending radially outside said periphery of said substrate holder.
2. The baffle plate assembly of claim 1, wherein said centering ring is coupled to said substrate holder using fasteners.
3. The baffle plate assembly of claim 1, wherein said centering ring comprises a centering feature configured to center said baffle plate on said centering ring.
4. The baffle plate assembly of claim 3, wherein said centering feature comprises at least one of a centering pin, a centering receptacle, a centering edge, and radial face gear teeth.
5. The baffle plate assembly of claim 3, wherein said baffle plate comprises a mating feature configured to be coupled with said centering feature.
6. The baffle plate assembly of claim 5, wherein said mating feature comprises at least one of a centering pin, a centering receptacle, a centering edge, and radial face gear teeth.

7. The baffle plate assembly of claim 1, wherein said centering ring is made from aluminum.
8. The baffle plate assembly of claim 1, wherein said baffle plate is made from at least one of aluminum, alumina, silicon, silicon carbide, silicon nitride, quartz, carbon, and ceramic.
9. The baffle plate assembly of claim 1, wherein a surface of said baffle plate comprises a protective barrier.
10. The baffle plate assembly of claim 1, wherein a portion of a surface of said baffle plate comprises a protective barrier.
11. The baffle plate assembly of claim 9 or 10, wherein said protective barrier comprises at least one of surface anodization, a coating formed using plasma electrolytic oxidation, and a spray coating.
12. The baffle plate assembly of claim 9 or 10, wherein said protective barrier comprises a layer of at least one of a III-column element and a Lanthanum element.
13. The baffle plate assembly of claim 9 or 10, wherein said protective barrier comprises at least one of  $\text{Al}_2\text{O}_3$ , Yttria ( $\text{Y}_2\text{O}_3$ ),  $\text{Sc}_2\text{O}_3$ ,  $\text{Sc}_2\text{F}_3$ ,  $\text{YF}_3$ ,  $\text{La}_2\text{O}_3$ ,  $\text{CeO}_2$ ,  $\text{Eu}_2\text{O}_3$ , and  $\text{Dy}_2\text{O}_3$ .

14. The baffle plate assembly of claim 1, wherein said one or more passageways comprises at least one of a slot, and an orifice.

15. The baffle plate assembly of claim 1, wherein at least one of the size, shape, and distribution of said one or more passageways varies on said baffle plate.

16. A disposable baffle plate for surrounding a substrate holder in a plasma processing system comprising:

a ring comprising a first edge configured to be coupled to said substrate holder via a centering ring with at least a portion of said centering ring extending radially outside a periphery of said substrate holder, a second edge configured to be proximate a wall of said plasma processing system, and one or more openings to permit the passage of gas therethrough,

wherein said coupling of said first edge to said centering ring facilitates centering said ring in said plasma processing system such that a space between said second edge and said wall is substantially constant.

17. A method of replacing a baffle plate disposed adjacent a centering ring with at least a portion of said centering ring extending radially outside a periphery of a substrate holder, said baffle plate surrounding said substrate holder in a plasma processing system, the method comprising:

removing said first baffle plate from said centering ring in said plasma processing system; and

installing a second baffle plate in said plasma processing system by coupling said second baffle plate to said centering ring, wherein said coupling facilitates auto-centering of said second baffle plate in said plasma processing system.

37 C.F.R. § 41.37(c)(ix) - Evidence appendix

None



37 C.F.R. § 41.37(c)(x) – Related proceedings appendix

None